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•96-DMR-RMRS-0107 Combination of OU1&OU2 Water Treatment Facilities to Create CWTF 11/08/96
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4-I57-ENV-OPS-FO 39 Calibration, Operation, and Maintenance of Monitoring and 1 12/02/94 Fluid Handling Equipment OU1, Bldg 891
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4-I60-ENV-OPS-FO 42 Chemical Cleaning Operations Consolidated Water 1 02/27/96 Treatment Facility
4-I61-ENV-OPS-FO 43 Filter Press Operation and Cleaning Consolidated Water 1 06/20/96 Treatment Facility
4-I62-ENV-OPS-FO 44 Granular Activated Carbon Transfer OU2, Field Treatability Unit 0 05/22/95
4-I63-ENV-OPS-FO 45 Chemical Handling and Mixing Operations Consolidated 1 04/03/96 Water Treatment Facility
4-S72-ENV-OPS-FO 46 System Normal Operations Oil-Absorbent Media Drum 0 05/20/96 Unit Consolidated Water Treatment Facility GRIMENT CLASSIFICATION REVIEW WATER

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This is a RELEATION TANK

This is a REMANDERATIONS

CONSOLIDATED WATER TREATMENT FACILITY

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Rocky Flats Environmental Technology Site 4-I55-ENV-OPS-FO.37

REVISION 1

NEUTRALIZATION TANK NORMAL OPERATIONS CONSOLIDATED WATER TREATMENT FACILITY

APPROVED BY

Vice President,

RMRS Environmental Restoration

/ MMTUGOV /4NOV 96

Print Name Date

DOE RFFO/ER Concurrence on file "Yes "No "NA

Environmental Protection Agency Approval Received ° Yes ° No ° NA

Responsible Organization Environmental Restoration Program Division Effective Date 11-08-94

CONCURRENCE BY THE FOLLOWING DISCIPLINES IS DOCUMENTED IN THE PROCEDURE HISTORY FILE

Environmental Operations Management Quality Assurance Subject Matter Expert

USE CATEGORY 3

ORC review not required

Periodic review frequency 1 year from the effective date

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1 PURPOSE

This procedure contains a description of the normal operations steps used at the Rocky Flats Environmental Technology Site (RFETS) for neutralizing and transferring neutralized regenerant from the Consolidated Water Treatment Facility (CWTF) Neutralization Tank T-210 to a tanker truck

2 SCOPE

This procedure applies to all Environmental Operations Management employees and subcontractors

This procedure addresses the following topics

- pH adjustment
- Tank T-210 transfer to tanker

3 OVERVIEW

This procedure describes the steps for neutralizing and transferring water from the ion exchange regeneration system which is collected in Tank T-210 at the CWTF. The CWTF consists of the following systems

- a groundwater recovery and storage system,
- a chemical precipitation/microfiltration system,
- an ultraviolet/hydrogen peroxide (UV/H₂O₂) oxidation system,
- a granular activated carbon vessel,
- an ion exchange system with units for acid and caustic regeneration of resin,
- a spent regenerant neutralization system, and
- a treated effluent storage and discharge system

A simplified diagram of the system is provided in Appendix 1, Influent Collection, Transfer and Storage, Normal Operations, CWTF, 4-I49-ENV-OPS-FO 31 A System Process Flow Diagram is provided in Appendix 2, Major Equipment list in Appendix 3 and valve designators, nomenclature, and types are provided in Appendix 4 of the same document

Following regeneration of the ion exchange resins as described in 4-I54-ENV-OPS-FO 36, Ion Exchange System Regeneration Operations, CWTF, all waste acid and caustic is collected in Tank T-210 for neutralization and transfer for final treatment to the Building 374 evaporator The Building 374 evaporator processes water with

- pH between 6 0 and 9 0
- Gross alpha activity less than 13,500 pCi/L
- Volatile organics (as indicated in Appendix 3)

3 OVERVIEW (continued)

Following neutralization to meet the requirements for the Building 374 evaporator, the waste in Tank T-210 is stored awaiting analytical radiological screening results. When the waste is confirmed as acceptable for treatment at the Building 374 evaporator, the waste is transferred to a tanker truck at the CWTF Truck Dock for transfer to Building 374 (Sampling requirements are identified the CWTF Sampling and Analysis Plan, RF/ER-96-0018A and any others determined to be necessary by the CWTF Responsible Manager)

4 LIMITATIONS AND PRECAUTIONS

- The steps in this procedure shall be followed to ensure that the treated water from Tank T-210 is safely transferred to a tanker
- Treatment of the waste in Tank T-210 involves the use of concentrated hydrochloric acid (HCl) and sodium hydroxide (NaOH) All health and safety requirements for handling these materials contained in the RFETS CWTF Health and Safety Plan (HASP) shall be followed
- Occasionally, limited volume is available for neutralizing chemicals to be added to tank T-210 Therefore, in an effort to neutralize T-210, regenerant waste may overflow to the Building 891 sump Since the sump contents are pumped directly into an influent tank, it is necessary to neutralize any overflow from the tank T-210 neutralizing process
- Because of the viscosity of the regenerant waste and the nature of the magnetic coupling of pump P-210, it is necessaty to start pump P-210 with the suction valve HVA-210 closed. Once the pump has been started, the suction side valve must be opened slowly to avoid disconnecting the magnetic coupling. If the magnetic coupling becomes disengaged, stop the pump, let the motor completely stop and retry

5 PREREQUISITES

5 1 Planning and Coordination

CWTF Responsible Manager

- [1] Arrange for the collection and analysis of samples of the neutralized waste water in Tank T-210
 - Samples are collected and analyzed in accordance with RF/ER-96-0018A, Sampling and Analysis Plan for the CWTF
- [2] Review the analytical results for the waste contained in Tank T-210 requiring transfer to the Building 374 evaporator to ensure that the neutralized regenerant meets the acceptance criteria for the Building 374 evaporator
- [3] Coordinates with Plant trucking to provide tanker situated in CWTF truck dock
- [4] Ensures that all personnel are trained and qualified to performs steps detailed in this procedure

5 1 Planning and Coordination (continued)

Lead Operator/Operator

- [1] Adjusts pH in tank T-210 with acid or caustic, as necessary
- [2] Assists with sampling of tank T-210
- [3] Transmits laboratory data to trucking supervisor prior to filling tanker
- [4] Informs CWTF Responsible Manager and Plant trucking supervisor of gallon total to be transferred from T-210
- [5] Connects hoses to tanker and fills tanker
- [6] Ensures that a 'Onsite Hazardous Waste' label has been applied to the tanker, once T-210 waste has been transferred
- NOTE 1 The waste is non-hazardous, however, once introduced into the tanker, it must be considered hazardous by regulation

Health and Safety Specialist

- [1] Conducts a safety briefing covering neutralization and tank transfer procedures prior to the initiation of the procedure
- [2] Provides support for sampling activities

6 INSTRUCTIONS—pH ADJUSTMENT

NOTICE

IF there is any indication of unexpected chemical reaction, such as increasing tank temperature, fumes eminating from the tank, or popping noises in the tank, stop the neutralization procedure immediately, following the steps below

- [A] Press Emergency Stop pushbutton
- [B] Evacuate the area and keep other personnel away
- [C] Notify supervision

61 pH Measurement

NOTE 1 Before operations to adjust the pH in Tank T-210, accurate measurement of the initial pH and pH following neutralization is necessary Several methods are available and acceptable for measurement of pH in Tank T-210

61 pH Measurement (continued)

Lead Operator/Operator

[1] Turn on T-210 mixer by placing the M-210 switch to ON

The M-210 switch is located on the MCP 891 Main Control Panel

- [2] Recirculate Tank T-210 to obtain an accurate pH measurement
 - [A] OPEN HVB-210, P-210 Outlet
 - [B] CLOSE HVC-210, Discharge Camlock
 - [C] OPEN the following valves
 - V-97, T-210 Purge Port
 - V-98, T-210 Sightglass
 - V-99, P-210 Effluent Isolation
 - V-117, T-210 Recirculation Isolation
 - [D] Start the recirculation pump, P-210 by placing switch P-210 to ON

The on/off switch for P-210 is located on the MCP 891 Main Control Panel

- [E] Immediately after starting pump P-210, slowly OPEN valve HVA-210
- [3] Allow the contents of T-210 to recirculate for at least 1/2 hour before recording an initial pH
- [4] Measure the initial pH, and the pH following neutralization, in accordance with <u>one</u> of the following methods
 - [A] Read the pH meter mounted on the east side of Tank T-210

The in-line pH meter mounted on the piping on the east side of Tank T-210 provides a direct indication of pH in the piping leading to Pump P-210 In order to obtain accurate readings from the instrument, Pump P-210 must be running to ensure that water is flowing through the pipe

[B] Read the remote pH meter at the touch screen panel in the motor control center

The meter records pH from a sensor mounted in the tank

- **NOTE 2** Appropriate personnel protective equipment is required to be worn and monitoring is required to be performed during sampling in accordance with the CWTF HASP
 - [C] Ensure that the portable pH meter is properly calibrated before use in accordance with the manufacturer's instructions

6 1 pH Measurement (continued)

Lead Operator/Operator

- [D] Take a sample of the waste at HVC-210, Discharge Camlock and analyze the sample using a portable pH meter
- [E] Pour the sample into the Building 891 sump, for transfer into an influent tank

6 2 pH Adjustment for Acid Neutralization

IF the pH of the waste in Tank T-210 is less than 60, then the waste must be neutralized with caustic

Lead Operator/Operator

[1] Start tank Mixer M-210 by placing switch M-210 to ON

The switch labeled M-210 is on the MCP 891 Main Control Panel to the left of the touch screen

- [2] Ensure that HVB-210, P-210 Outlet is OPEN
- [3] Ensure that HVC-210, Discharge Camlock is CLOSED
- [4] Ensure that the following valves are OPEN
 - V-97, T-210 Purge Port
 - V-98, T-210 Sightglass
 - V-99, P-210 Effluent Isolation
 - V-117, T-210 Recirculation Isolation
- [5] Ensure that V-100, P-210 Discharge Isolation is CLOSED

V-100 is on the upright portion of the tee

- [6] Start Pump P-210 by placing switch P-210 to ON
- [7] Immediately OPEN valve HVA-210, inlet to P-210 slowly
- [8] OPEN automatic valves FV-17, Dilute Caustic for T-210 Neutralization and FV-19, Caustic Regenerant by hand

Valves are on the skid between Tanks T-209 and T-208

[9] Start Pump P-5

62 pH Adjustment for Acid Neutralization (continued)

Lead Operator/Operator (continued)

- [A] Verify that the yellow light on the MCP 891 Main Control Panel is ON, and listen for pump operation
- [10] AFTER 5 to 10 seconds, THEN stop P-5
- [11] Turn on pump P-3 and AFTER 10 to 20 seconds, THEN stop P-3
 - P-3 flushes the contents of the piping into Tank T-210
- [12] Allow the pH of the water to equilibrate for approximately 10 minutes
- [13] Observe the pH of the water using any of the following
 - On the local readout
 - On the Allen/Bradley screen
 - With a portable meter
- [14] IF the waste water pH is still less than 6 0, THEN repeat Steps [8] through [12] until waste water pH is between 6 0 and 9 0
- [15] WHEN the waste water pH is between 6 0 and 9 0, THEN
 - [A] Place Switch P-210 to OFF, and immediately close valve HVA-210
 - IBI Place Switch M-210 to OFF
- [16] Record all activities in the CWTF Daily Log book

63 pH Adjustment for Caustic Neutralization

IF the pH of the water in Tank T-210 is greater than 9 0, then the waste solution must be neutralized with acid

Lead Operator/Operator

- [1] Start the tank Mixer, M-210 by placing Switch M-210 to ON
 - Switch M-210 is on the MCP 891 Main Control Panel to the left of the touch screen

1 _ _ _ _

- [2] OPEN HVB-210, P-210 Outlet
- [3] CLOSE HVC-210, Discharge Camlock

63 pH Adjustment for Caustic Neutralization (continued)

Lead Operator/Operator (continued)

- [4] Ensure that the following valves are OPEN
 - V-97, T-210 Purge Port
 - V-98, T-210 Sightglass
 - V-99, P-210 Effluent Isolation
 - V-117, T-210 Recirculation Isolation
- [5] Ensure that V-100, P-210 Discharge Isolation is CLOSED

V-100 is on the upright portion of the tee

[6] Start Pump P-210 by placing switch P-210 to ON

Switch P-210 is on the control panel next to Switch M-210

- [7] Immediately OPEN valve HVA-210 slowly
- [8] OPEN automatic valves FV-7, Dilute Acid for T-210 Neutralization and FV-9, Acid Regenerant by hand

Valves are on a skid between Tanks T-209 and T-208

- [9] Start Pump P-4
 - [A] Verify that the yellow light on the control panel is ON and listen for pump operation
- [10] AFTER 5 to 10 seconds, THEN stop P-4
- [11] START pump P-3 and run for 10 to 20 seconds, THEN stop P-3
 - P-3 running flushes the contents of the piping into Tank T-210
- [12] Allow the pH of the water to equilibrate for approximately 10 minutes
- [13] Observe the pH of the water using any of the following
 - On the local readout
 - On the Allen/Bradley screen
 - With a portable meter
- [14] IF the waste water pH is still greater than 9 0, THEN repeat Steps [8] through [12] until waste water pH is between 6 0 and 9 0

63 pH Adjustment for Caustic Neutralization (continued)

Lead Operator/Operator (continued)

- [15] WHEN the waste water pH is between 6 0 and 9 0, THEN
 - [A] Place Switch P-210 to OFF, and immediately CLOSE valve HVA-210
 - [B] Place Switch M-210 to OFF
- [16] Record all activities in the CWTF Logbook

7 INSTRUCTIONS—TANK T-210 TRANSFER TO TANKER

7 1 Water Transfer

When the water has been neutralized, sampled, analyzed and determined to be acceptable to the 374 Evaporator, the regenerant solution must be transferred from tank T-210 to a suitable tanker

Lead Operator/Operator

- [1] Record all water transfers from Tank T-210 on Appendix 1, Material Transfer Checklist
- [2] Inspect the tanker for the following characteristics
 - Appropriate size (capacity)
 - Cracks in the frame
 - Wheels chocked
 - Valving for adequate venting during transfer
- [3] Hook up a 2-in hose from the inlet connection of the tanker to the Tank T-210 discharge connection at the Building 891 wall in the truck dock
 - A 2 -in to 3-in adaptor may be used, as necessary
- [4] OPEN HVD-210, Discharge to Truck behind Tank T-209 along the inside north wall of Building 891
- [5] OPEN HVB-210, P-210 Outlet
- [6] CLOSE HVC-210, Discharge Camlock
- [7] OPEN the following valves
 - V-97, T-210 Purge Port
 - V-98, T-210 Sightglass
 - V-99, P-210 Effluent Isolation
 - V-117, T-210 Recirculation Isolation
- [8] Ensure that V-100, P-210 Discharge Isolation is CLOSED

7 1 Water Transfer (continued)

- [9] OPEN the tanker influent valve(s)
- [10] OPEN vent valves on the tanker
- [11] Verify the valving and the connections
- [12] Start tank mixer by placing switch M-210 into ON
- [13] Start Pump P-210 by placing Switch P-210 to ON
- [14] Immediately OPEN HVA-210 slowly
- [15] After P-210 is known to be operational, OPEN valve V-100, P-210 Discharge Isolation and CLOSE valve V-117, Recirculation Isolation
- [16] Observe the level in the sightglass on the east side of Tank T-210 periodically to ensure that P-210 is pumping the water out of Tank T-210
 - Pump P-210 automatically shuts off before the level in Tank T-210 reaches 1 foot
- [17] Turn the P-210 switch at the control panel to OFF
- [18] CLOSE HVD-210 and HVA-210
- [19] CLOSE all of the valves on the tanker
- [20] Don personal protection equipment in accordance with the requirements of the RFETS CWTF HASP
- [21] Place a bucket under the hose end to collect water remaining in the hose
- [22] Carefully disconnect all of the hoses from the tanker and the building, and collect all spillage in the bucket(s)
- [23] Dump the water collected in the bucket(s) into the Building 891 sump
- [24] CLOSE the vent(s) on the tanker
- [25] OPEN V-117
- [26] CLOSE V-100
- [27] Notify the CWTF Responsible Manager to inform the Building 374 Evaporator Shift Manager that the tanker is ready to pick up
- [28] Complete Appendix 2, Neutralized Waste Tank T-210 Logsheet

7 1 Water Transfer (continued)

Lead Operator/Operator (continued)

- [29] File the Neutralized Waste Tank T-210 Logsheet in the facility operations files
- [30] Record all activities in the CWTF Logbook

8 POST-PERFORMANCE ACTIVITIES

Management of all records is consistent with 1-77000-RM-001, Records Management Guidance for Records Sources

CWTF Responsible Manager

- [1] Ensure that the original and one copy of the following quality related records, as appropriate, are transmitted to the ERPD Project File Center in accordance with 2-G18-ER-ADM-17 01
 - Material Transfer Checklist
 - Neutralized Waste Tank T-210 Logsheet

Submission of record copies to the ERPD File Center satisfies Administrative Record requirements as defined in 3-21000-ADM-17 02, Administrative Records Screening and Processing

There are no nonquality records generated by this procedure

9 REFERENCES

Consolidated Water Treatment Facility Health and Safety Plan

RF/ER-96-0018A, Sampling and Analysis Plan, CWTF

1-77000-RM-001, Records Management Guidance for Records Sources

2-G 18-ER-ADM-17 01, Records Capture and Transmittal

3-21000-ADM-17 02, Administrative Records Screening and Processing

4-I54-ENV-OPS-FO 36, Ion Exchange System Regeneration Operations, CWTF

4-I49-ENV-OPS-FO 31, Influent Collection, Transfer and Storage, Normal Operations, CWTF

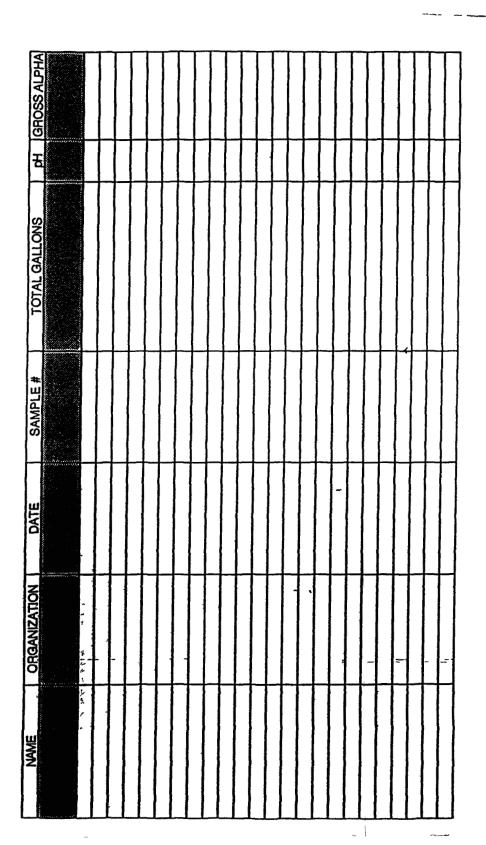
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MATERIAL TRANSFER CHECKLIST

Transfer Date T	anker Number
<u>Description</u>	Operator Initials
Tanker inspection is completed	
Transfer hose is connected	
Tanker is properly vented	
Transfer valve lineup is completed and checked	
Transfer is completed	
(Gallons transferred)	
Normal valve lineup is completed and checked	
Hoses are disconnected	
Tanker vent is closed	
Building 374 Evaporator Shift Manager is notified to	pick up the tanker

APPENDIX 2 Page 1 of 1



NEUTRALIZED WASTE TANK NO. 210

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APPENDIX 3

Page 1 of 1

This table is excerpted from the B-374 Waste Acceptance Criteria, Section C. Content Requirements, Organic Chemicals

Contaminant	MCL (ppm)	(ppb)
Vinyl Chloride	0 002	2 0
Benzene	0 005	5 0
Carbon Tetrachloride	0 005	5 0
1,2-Dichloroethane	0 005	5 0
Trichloroethylene	0 005	5 0
para-Dıchlorobenzene	0 075	7 5
1,1-Dichloroethylene	0 007	70
1,1,1-Trichloroethane	0 200	200 0
cis-1-Dichloroethylene	0 070	70 0
1,2-Dichloropropane	0 005	5 0
Ethylbenzene	0 700	700 0
Monochlorobenzene	0 100	100 0
o-Dichlorobenzene	0 600	600 0
Styrene	0 100	100 0
Tetrachloroethylene	0 005	5 0
Toluene	1 000	1000 0
trans-1,2-Dichloroethylene	0 100	100 0
Xylenes (total)	10 000	10000 0
Dichloromethane	0 005	5 0
1,2,4-Trichlorobenzene	0 070	70 0
1,1,2-Trichloroethane	0 005	50